



# Silica in Construction

## Overview of MIOSHA Part 690

MIOSHA

Consultation Education and Training Division  
517-284-7720



# Objectives

To provide an overview of MIOSHA Part 690, Silica in Construction.

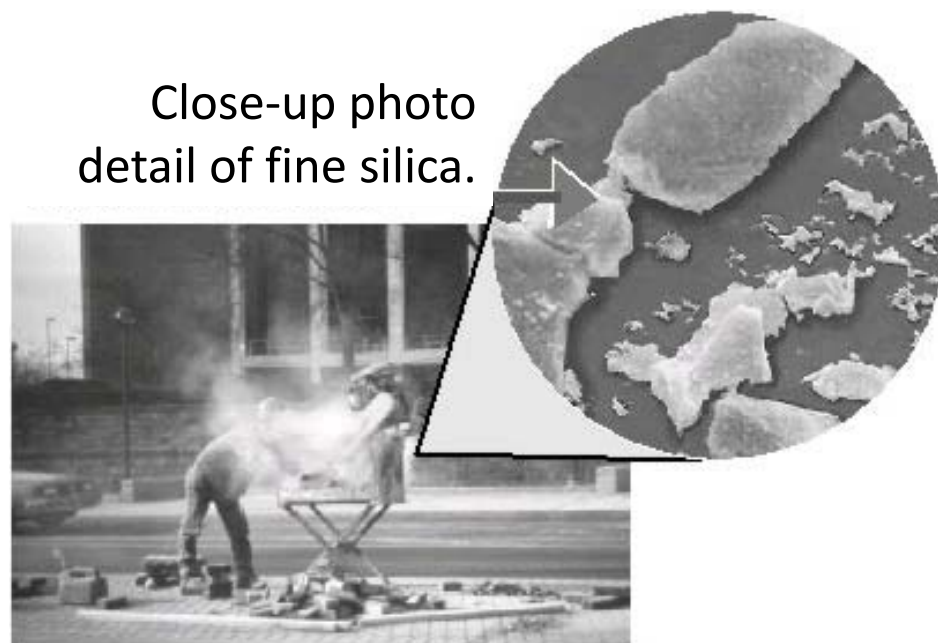




# MIOSHA Silica Standards

- Address respirable crystalline silica exposures:
- Two standards in Michigan:
  - MIOSHA Part 590, Silica in **General Industry**.
  - MIOSHA Part 690, Silica in **Construction**.
  - Maritime industry is addressed by federal OSHA.
- Adopts the federal OSHA requirements by reference.

Close-up photo detail of fine silica.



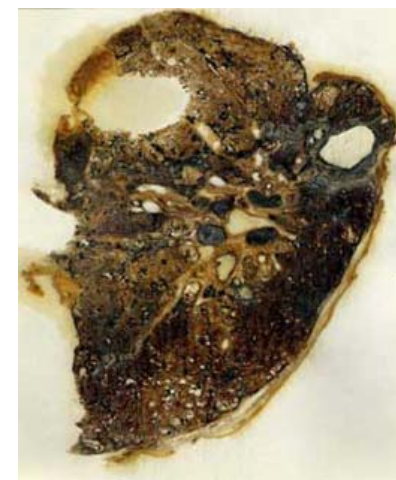


## Exposure and Health Risks

- OSHA estimates **more than 840,000 employees in construction** and **more than 100,000 employees in general industry** are exposed to workplace silica levels that **exceed the revised permissible exposure limit (PEL)**.
- Exposure to respirable crystalline silica has been linked to:
  - Silicosis,
  - Lung cancer,
  - Chronic obstructive pulmonary disease (COPD), and
  - Kidney disease.



Healthy Lung



Silicotic Lung



# Silicosis in Michigan

- 866 Confirmed cases 1985-2002
- Averaged 64 cases per year from 1987-1997
  - 34 cases in 2000, last complete year
  - Data indicates under-reporting, projected data indicated 83-170 additional cases for 2000



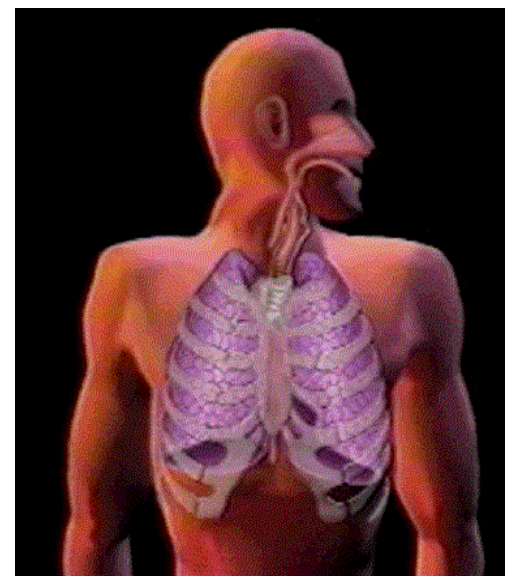
# SYMPTOMS

- Difficulty in Breathing
- Cough
- Infections Causing
  - Fever
  - Weight Loss
  - Night Sweats



# Types of Silicosis

- Chronic
  - 10 or More Years of Exposure
  - Low Exposure Concentrations
- Accelerated
  - 5 to 10 Years After Exposure
  - High Exposure Concentrations
- Acute
  - A Few Weeks to 4 or 5 Years After Exposure
  - Highest Exposure Concentrations





# Tasks/Activities At Risk of Exposure to Silica

Not An All-Inclusive Listing

- Using tools and heavy equipment for demolition.
- Chipping, cutting, sawing, drilling, grinding, sanding, and crushing of concrete, brick, block, rock, and stone products.
- Use of sand products.
- Use of handheld power saws without dust controls to cut concrete.





# Silica in Construction

MIOSHA Part 690 (adopts 29 CFR 1926.1153)

- Scope and application
- Definitions
- Specified exposure control methods,  
...OR...
- Alternative exposure control methods:
  - Permissible exposure limit (PEL)
  - Exposure assessment
  - Methods of compliance
- Respiratory protection
- Housekeeping
- Written exposure control plan
- Medical surveillance
- “Communication of silica hazards”
- Recordkeeping
- Dates



# Scope: Construction

Part 690, Rule 69001



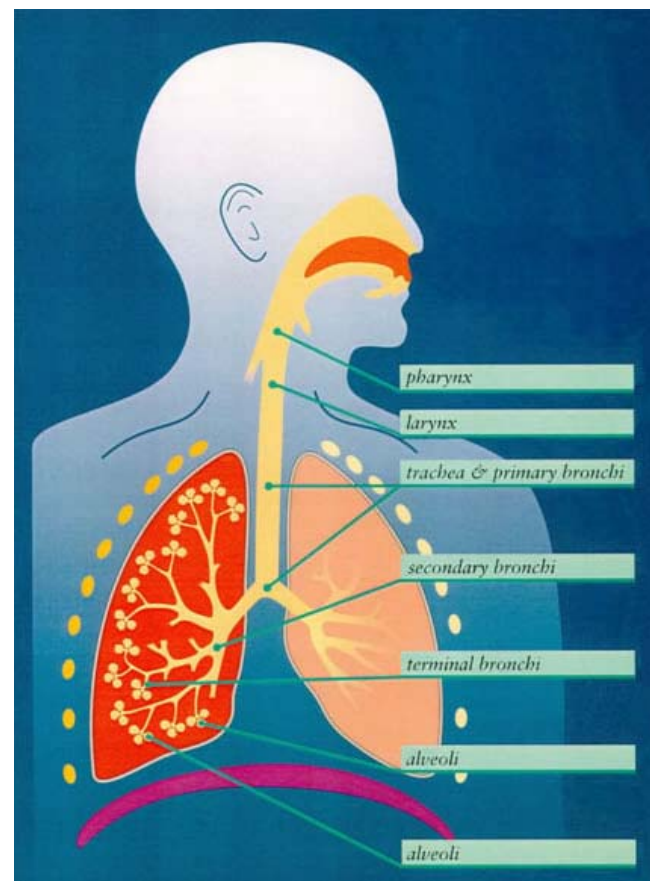
- ***Applies to all occupational exposures to respirable crystalline silica in construction work,***
- ***Except where employee exposure will remain below 25 micrograms per cubic meter of air ( $25 \mu\text{g}/\text{m}^3$ ) as an 8-hour time weighted average (TWA) under any foreseeable conditions.***



# Definition: Respirable Crystalline Silica

Part 690, Rule 69015 (9)

- Silica is comprised of **crystalline quartz, cristobalite, and/or tridymite**.
- The **respirable fraction** (10 microns in diameter or less) is of greatest concern as these tiny, dagger-like particles have the **potential to reach the delicate alveolar lung tissue**.





## PARTICLE SIZE

- 1 micron ( $\mu\text{m}$ ) = 1/26,000 inch
- Dust  $< 50 \mu\text{m}$  can not be seen
- Respirable particles  $< 10 \mu\text{m}$



Human Hair



# Definition: Objective Data

## Part 690, Rule 69015 (7)

- **Information**, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, **demonstrating employee exposure to respirable crystalline silica associated with a particular product or material or a specific process, task, or activity.**
- The **data must reflect workplace conditions closely resembling (*or with a higher exposure potential*)** than the processes), types of material, control methods, work practices, and environmental conditions in the employer's current operations.



## Objective Data Example

- **Jobsite A**: Exposure monitoring reveals employee exposures =  $20 \mu\text{g}/\text{m}^3$ ; use of portable handsaw to cut the concrete floor in a  $40' \times 40' \times 10'$ , vented room; wet methods and HEPA vacuums are used; the concrete is 15% crystalline quartz.
- **Jobsite B**: No exposure monitoring has been performed; the employer wishes to use data from Jobsite A. The work at this site involves use of a portable handsaw to cut the concrete floor in a  $20' \times 20' \times 8'$ , unvented room; wet methods and HEPA vacuums are used; the concrete is 25% crystalline quartz.

**Can the employer use the data obtained at Jobsite A to represent employee exposures at Jobsite B?**

**NO, due to the elevated % silica content and decrease in room size.**



# Definition: Competent Person

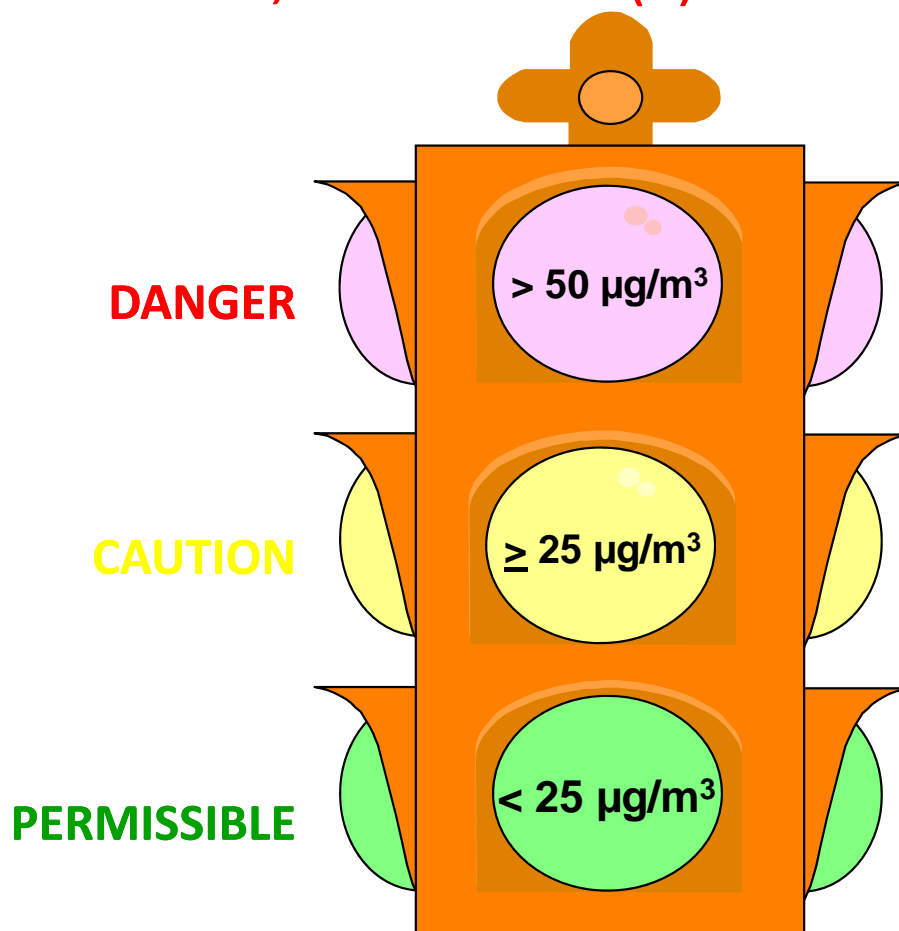
## Part 690, Rule 69015 (4)

- Capable of identifying existing and foreseeable respirable crystalline silica hazards.
- Has authorization to take prompt corrective measures to eliminate or minimize identified hazards.
- Has the knowledge and ability necessary to fulfill the responsibilities set forth in the **written exposure control plan** section of the standard: 1926.1153 (g)
- Makes frequent and regular inspection of job sites, materials, and equipment



# Silica Exposure Limits

Part 590, 1910.1053 (c) and Part 690, 1926.1153 (d)(1)



- **PEL:** permissible exposure limit  
 **$50 \mu\text{g}/\text{m}^3$ , 8-hr TWA**
- **AL:** action limit  
 **$25 \mu\text{g}/\text{m}^3$ , 8-hr TWA**





# Exposure Assessment and Control

## Part 690, Construction

- **29 CFR 1926.1153 (c): Table 1**
  - Table 1
  - Means of exhaust, wet methods, and enclosed cabs/booths
  - Multiple Table 1 tasks performed during a work shift

**...OR...**

- **29 CFR 1926.1153 (d):**
  - Permissible exposure limit (PEL)
  - Exposure assessment
  - Methods of compliance



# Specified Exposure Control Methods

## Part 690, 1926.1153 (c)

- *For each employee engaged in a task identified on Table 1, the employer shall fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task on Table 1, unless the employer assesses and limits the exposure of the employee to respirable crystalline silica in accordance with paragraph (d) of this section.*
- Employees are “**engaged in a task**” when:
  - Operating the listed equipment,
  - Assisting with the task, OR
  - Having some responsibility for the completion of the task.
- Employees are **not “engaged in a task”** if they are only in the vicinity of a task.



# Specified Exposure Control Methods

## Part 690, 1926.1153 (c)(1), Table 1 Equipment/Tasks

1. Stationary masonry saws
2. Handheld power saws
3. Handheld power saws for cutting fiber-cement board
4. Walk-behind saws
5. Drivable saws
6. Rig-mounted core saws or drills
7. Handheld and stand-mounted drills
8. Dowel drilling for concrete
9. Vehicle-mounted drilling rigs for rock and concrete
10. Jackhammers and handheld powered chipping tools
11. Handheld grinders for mortar removal (i.e., tuckpointing)
12. Handheld grinders for uses other than mortar removal
13. Walk-behind milling machines and floor grinders
14. Small drivable milling machines
15. Large drivable milling machines
16. Crushing machines
17. Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials
18. Heavy equipment and utility vehicles for tasks such as grading and excavating



# Example of Part 690 Table 1 Task/Activity

## Stationary Masonry Saw





# Example of Part 690 Table 1 Task/Activity

## Stationary Masonry Saw

Equipment or Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
<b>Stationary masonry saws</b>	<p>Use saw <b>equipped with integrated water delivery system</b> that continuously feeds water to the blade.</p> <p><b>Operate and maintain tool in accordance with manufacturer's instructions</b> to minimize dust emissions.</p>	None	None





## Example of Part 690 Table 1 Task/Activity

Handheld Power Saws (any blade diameter)





# Example of Part 690 Table 1 Task/Activity

## Handheld Power Saws (any blade diameter)

Equipment or Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Handheld power saws (any blade diameter)	Use saw <b>equipped with integrated water delivery system</b> that continuously feeds water to the blade.		
	<b>Operate and maintain tool in accordance with manufacturer's instructions</b> to minimize dust emissions.		
	When used <b>outdoors</b>	None	APF 10
	When used <b>indoors</b> or in an <b>enclosed area</b>	APF 10	APF 10



## Example of Part 690 Table 1 Task/Activity

Handheld grinders for mortar removal (i.e., tuckpointing)







## Example of Part 690 Table 1 Task/Activity

Handheld grinders for mortar removal (i.e., tuckpointing)

Equipment or Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Handheld grinders for mortar removal (i.e., tuckpointing)	<ul style="list-style-type: none"><li>-Equipped w/ commercially available shroud &amp; dust collection</li><li>-Dust collector must provide <math>\geq 25</math> cfm per inch of wheel diameter</li><li>-Filter w/ <math>\geq 99\%</math> efficiency</li><li>-Cyclonic pre-separator or filter-cleaning mechanism</li></ul>	APF 10	APF 25



## Example of Part 690 Table 1 Task/Activity

Walk-behind milling machines & floor grinders

No Controls



With Controls





# Example of Part 690 Table 1 Task/Activity

Walk-behind milling machines & floor grinders

Equipment or Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Walk-behind milling machines & floor grinders	-Equipped w/ integrated water delivery system -Continuous water feed to cutting surface	None	None
	Or -Equipped w/ dust collection system recommended by Mfg. -Dust collection must provide air flow ≥ recommended by Mfg -Filter ≥ 99% efficiency (HEPA) -Filter-cleaning mechanism -Indoors/enclosed areas – HEPA vac to remove loose dust between passes	None	None



# Implementation of Table 1 Control Measures

Part 690, 1926.1153 (c)(2)

- Tasks performed indoors or in enclosed areas
- Tasks performed using wet methods
- Measures implemented that include an enclosed cab or booth



# Tasks Performed Indoors or in Enclosed Areas

Part 690, 1926.1153 (c)(2)(i)

Provide a means of exhaust as needed to minimize the accumulation of visible airborne dust.





# Tasks Performed Using Wet Methods

Part 690, 1926.1153 (c)(2)(ii)



Apply water at flow rates sufficient to minimize release of visible dust.





# Measures Including an Enclosed Cab or Booth

Part 690, 1926.1153 (c)(2)(iii)



## Ensure that the enclosed cab or booth:

- A. Is maintained as free as practicable from settled dust;
- B. Has door seals and closing mechanisms that work properly;
- C. Has gaskets and seals that are in good condition and working properly;
- D. Is under positive pressure maintained through continuous delivery of fresh air;
- E. Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0  $\mu\text{m}$  range (e.g., MERV-16 or better); and
- F. Has heating and cooling capabilities.



# Performing > One Table 1 Task During a Shift

Part 690, 1926.1153 (c)(3)

- Where an employee **performs more than one task on Table 1 during the course of a shift, and the total duration of all tasks combined is more than four hours**, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift.
- If the **total duration of all tasks on Table 1 combined is less than four hours**, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.





# Alternative Exposure Control Methods

Part 690, 1926.1153 (d)

- For tasks **not addressed by Table 1**,
- OR**
- Where one **cannot fully and properly implement** the engineering controls, work practices, and respiratory protection specified by Table 1, **THEN comply with paragraph (d)**.



Employee using demo saw without water control measures; exposure > 45× new OSHA PEL for respirable crystalline silica.



# Exposure Assessment

## Part 690, 1926.1153 (d)(2)

The employer shall **assess the exposure of each employee who is or may reasonably be expected to be exposed to respirable crystalline silica at or above the action level** in accordance with either the **performance option** or the **scheduled monitoring option** of the sections.



[illegible]



# Scheduled Monitoring Option

Part 690, 1926.1153 (d)(2)(iii)

- Initial monitoring to assess the 8-hour TWA exposure to be representative of:
  - Each shift
  - Job classification
  - Work area.
- In representative sampling = employees with **highest exposure** to respirable crystalline silica.



# AIR SAMPLING EQUIPMENT

## Personal Air Pump with Cyclone







## Sanding Overexposure - Example



- Drywall Hanger – during typical joint compound / drywall sanding. Pole sander used connected to shop vacuum (specially designed for lead remediation).
- *Results for Silica =  $0.53 \text{ mg/m}^3$  TWA*
- That was more than 10X the PEL using recommended controls!



# Joint Compound Safety Data Sheet (SDS) Section 3

Note: Silica not listed  
In Section 3 as an  
“ingredient”

## Section 3: Composition/Information on Ingredients

Chemical Name	Common name/ Synonym	Identifiers CAS Number	% (weight)
Calcium Carbonate or Calcium/Magnesium Carbonate	Limestone or Dolomite	1317-65-3 16389-88-1	<50
<u>And may contain one or more of the following:</u>			
Mixture-silicates and aluminates	Mica	12001-26-2	<10
Hydrated magnesium silicate	Talc (non-asbestiform)	14807-96-6	<5
Mixture-various metal oxides	Perlite	93763-70-3	<10
magnesium aluminum phyllosilicate	Attapulgite Clay	12174-11-7	<5
Magnesium silicate	Sepiolite Clay	63800-37-3	<5
Magnesium aluminum phyllosilicate	Smectite Clay	1302-78-9	<5
Polyvinyl Acetate Latex		9003-20-7	<5
Ethylene Vinyl Acetate Latex		24937-78-8	<5
Vinyl Acetate/Acrylic Copolymer		108-05-4	<5



# Joint Compound SDS Section 11

## *Safety Data Sheet*

## Ready Mix Joint Compounds

### Carcinogenicity

Not available

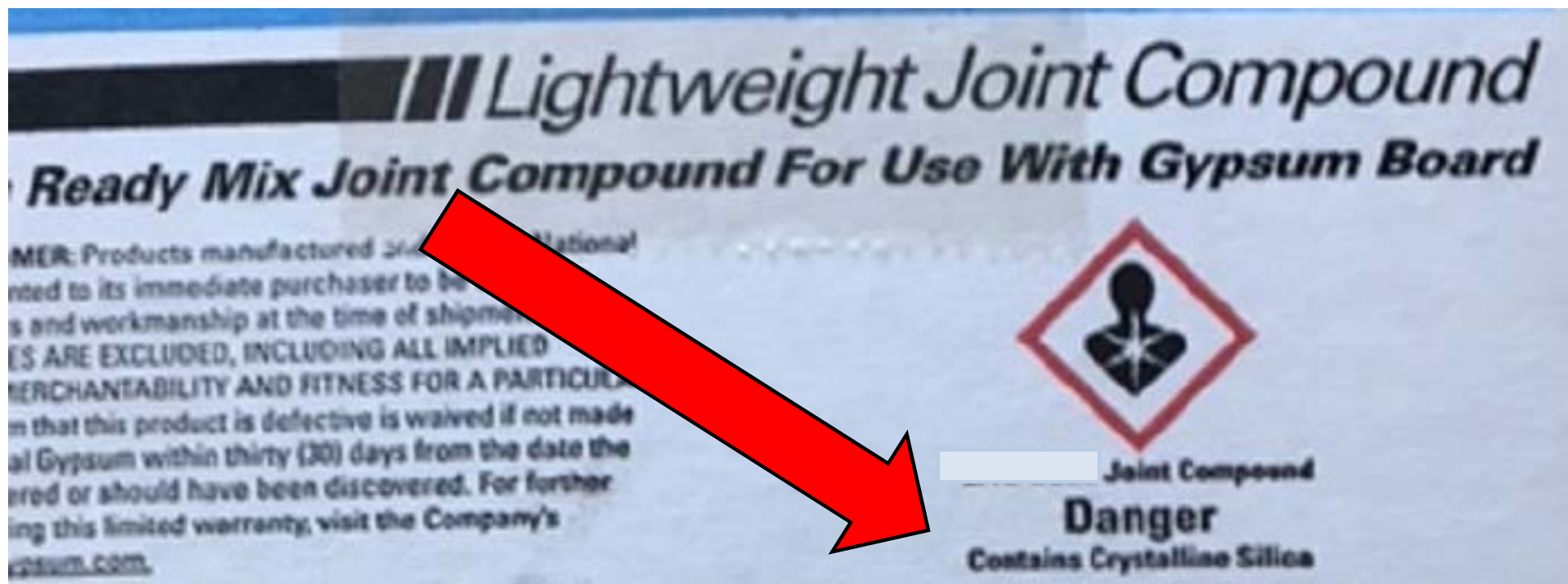
This product contains crystalline silica (quartz) as a naturally occurring impurity in some of the raw materials. The International Agency for Research on Cancer (IARC) classifies crystalline silica inhaled in the form of quartz or cristobalite from occupational sources as carcinogenic to humans, Group 1. The National Toxicology Program (NTP) classifies respirable crystalline silica as a substance which may be reasonably anticipated to be a carcinogen. OSHA does not regulate crystalline silica as a human carcinogen. Some products may contain attapulgite clay. IARC classifies attapulgite (long fiber) carcinogenic to humans, Group 2B. Attapulgite is not classified as a carcinogen by NTP or OSHA.

Exposures to respirable crystalline silica are not expected during the recommended use of this product. However, actual levels must be determined by workplace Industrial Hygiene testing.





## Joint Compound Label





## Frequency of Monitoring

Initial results  $< AL$   $\longrightarrow$  No additional monitoring

Most recent result  $\geq AL$   $\longrightarrow$  Repeat again within 6 months

Most recent result  $> PEL$   $\longrightarrow$  Repeat again within 3 months

Two consecutive non-initial, results, taken 7 or more days apart but less than 6 months, are  $< AL$   $\longrightarrow$  Can discontinue monitoring

If/when conditions change...

**REASSESS!**



# Reassessment of Exposures

Part 690, 1926.1153 (d)(2)(iv)

- Reassess exposures **whenever a change in the production, process, control equipment, personnel, or work practices** may reasonably be expected to result in new or additional exposures at or above the action level,  
**OR**
- When the employer has any reason to believe that **new or additional exposures** at or above the action level have occurred.



# Methods of Sample Analysis

Part 690, 1926.1153 (d)(2)(v)

- Employers must ensure that samples are analyzed by a laboratory that follows the procedures in **Appendix A**.
- **Appendix A** specifies methods of sample analysis:
  - Allows for use of OSHA, NIOSH, or MSHA methods (six methods specified).
  - Analysis must be conducted by accredited laboratories that follow specified quality control procedures.





# Employee Notification

Part 690, 1926.1153 (d)(2)(vi)

- **Individually notify in writing each affected employee within 5 days of the exposure assessment of the results of that assessment or post the results in an appropriate location** accessible to all affected employees.
- Whenever an exposure assessment indicates that **employee exposure is above the PEL**, the employer shall **describe in the written notification the corrective action being taken** to reduce employee exposure to or below the PEL.



# Observation of Monitoring

Part 690, 1926.1153 (d)(2)(vii)

- Where air monitoring is performed to comply with the requirements of this section, the employer shall **provide affected employees or their designated representatives an opportunity to observe any monitoring** of employee exposure to respirable crystalline silica.
- When observation of monitoring requires entry into an area where the use of protective clothing or equipment is required for any workplace hazard, the **employer shall provide the observer with protective clothing and equipment at no cost** and shall ensure that the observer uses such clothing and equipment.





# Methods of Compliance

Part 690, 1926.1153 (d)(3)

- Engineering and work practice controls
- Abrasive blasting
- Written exposure control plan



# Engineering and Work Practice Controls

Part 690, 1926.1153 (d)(3)(i)

- Employers shall **use engineering and work practice controls** to limit exposures to or below the PEL unless they are demonstrated to be not feasible.
- Use such controls even if they do not reduce exposures to or below the PEL; **use to achieve lowest feasible level.**
- **Respirators permitted where PEL cannot be achieved** with engineering and work practice controls

Wet methods



HEPA vacuum



HEPA-filtered  
respiratory  
protection





# Construction Engineering Control Example

## Grinding



Grinding without engineering controls



Grinding using a vacuum dust collector



# Construction Engineering Control Example

## Jackhammer



Jackhammer use without engineering controls



Jackhammer use with water spray to control dust



# Written Exposure Control Plan

## Part 690, 1926.1153 (g)

### Silica Exposure Control Plan

#### Contents

Silica Exposure Control Plan.....	1
Statement of Purpose .....	2
Changes to Policy.....	2
Silica Background Information .....	2
Health Hazards .....	3
Responsibilities.....	4
Risk Identification (29 CFR 1926.1153 (g) (1) (i)).....	5
OSHA Requirements (Action Level, PEL) .....	5
Engineering Controls, Work Practices & Respiratory Protection 29 CFR 1926.1153 (g) (1) (ii).....	6
Housekeeping: 29 CFR 1926.1153 (g) (1) (iii).....	18
Site Control: 29 CFR 1926.1153 (g) (1) (iv) .....	18
Medical Surveillance .....	19
Employee Training 29 CFR 1926.1153 (i) (2) (i).....	21
Recordkeeping (29 CFR 1926.1153 (j)).....	22

The employer shall **establish and implement a *written exposure control plan*** that contains at least the following elements:

– Description of:

- Tasks with respirable silica exposure
- Control measures, etc.
- Housekeeping measures
- Procedures use to restrict access to work areas (construction only).



# Written Exposure Control Plan – continued

## Part 690, 1926.1153 (g)

### Silica Exposure Control Plan

#### Contents

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Recordkeeping (29 CFR 1926.1153 (j)).....	22

- **Review** the plan **annually**; update as necessary.
- **Make** the plan **readily available**.





# Competent Person

Part 690, 1926.1153 (g)(4)



The employer shall **designate a competent person** to:

1. Make **frequent and regular inspections** of job sites, materials, and equipment to...
2. **Implement the written exposure control plan.**



# Abrasive Blasting

Part 690, 1926.1153 (d)(3)(ii)



The employer shall **comply with other OSHA standards**, when applicable, where abrasive blasting is conducted using crystalline silica-containing blasting agents, or where abrasive blasting is conducted on substrates that contain crystalline silica.



# Respiratory Protection

Part 690, 1926.1153 (e)

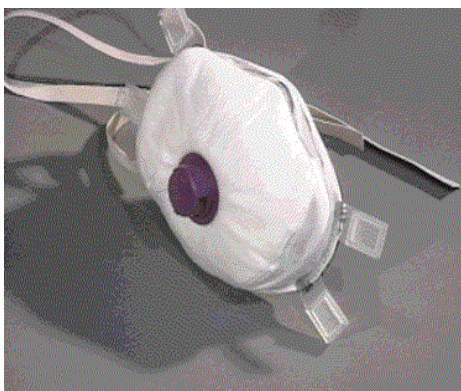


- **Must comply with MIOSHA Part 451.**
- If exposures exceed the PEL, respirators are required:
  - For tasks where controls and/or work practices are not feasible.
  - While installing or implementing feasible controls and/or work practices.
  - When implemented feasible controls measures and/or work practices do not reduce exposures below the PEL.
  - As required by Table 1 for construction employers.
  - While employees are in a regulated area for GI employers.



# TYPES OF RESPIRATORS

Half Mask Air Purifying Respirator  
APF=10



Full Face Air Purifying Respirator  
APF= 50







# TYPES OF RESPIRATORS

Full Face Powered Air Purifying Respirator  
APF=50





# TYPES OF RESPIRATORS



## Abrasive Blasting

Type CE Positive Pressure  
Blast Hood  
APF= 25 - 2,000





# Housekeeping – Dry Sweeping/Brushing

Part 690, 1926.1153 (f)(1)

- The employer **shall not allow dry sweeping or dry brushing** where such activity could contribute to employee exposure to respirable crystalline silica ***...unless...***
- Wet sweeping, HEPA-filtered vacuuming or other **methods that minimize the likelihood of exposure *are not feasible***.
- Burden on employer to prove infeasibility

Note: using sweeping compounds (e.g. non-grit or wax-based) is acceptable dust suppression housekeeping method.





# Housekeeping – Compressed Air

Part 690, 1926.1153 (f)(2)

The employer **shall not allow compressed air to be used to clean clothing or surfaces** where such activity could contribute to employee exposure to respirable crystalline silica **unless:**

- The compressed air is **used in conjunction with a ventilation system** that effectively captures the dust cloud created by the compressed air; **OR**
- **No alternative method** is feasible.





# Medical Surveillance

Part 690, 1926.1153 (h)

Baseline within 30 days after initial assignment:

Employers must ***make available*** medical examinations to **workers required to wear a respirator for 30 or more days a year.**





# Medical Surveillance

Part 690, 1926.1153 (h)

## FREQUENCY and CONTENT:

- Employers must **offer examinations every three years** to workers who continue to be exposed above the trigger.
- **Exam includes:** medical and work history, physical exam, chest X-ray, and pulmonary function test, TB test (on initial exam only), and any other test deemed appropriate by the PLHCP.





# Medical Surveillance

## Part 690, 1926.1153 (h)

- **Worker receives report** with detailed medical findings.
- **Employer receives an opinion** that only describes limitations on respirator use, and if the worker gives written consent, recommendations on:
  - Limitations on exposure to respirable crystalline silica, and/or
  - Examination by a Specialist.







# Communication of Silica Hazards – HAZCOM

Part 690, 1926.1153 (i)

## HAZARD COMMUNICATION

- Include respirable crystalline silica
- **Access to labels** on containers of crystalline silica **and safety data sheets**, and is trained in accordance with the provisions of HCS and Part 690.
- Ensure that at least the following hazards are addressed: **cancer, lung effects, immune system effects, and kidney effects.**







# Communication of Silica Hazards – Info/Train

## Part 690, 1926.1153 (i)

Each employee shall demonstrate knowledge and understanding of:

- **Health hazards** associated with exposure to respirable crystalline silica;
- Specific **tasks in the workplace** that could result in exposure to respirable crystalline silica;
- Specific **measures the employer has implemented** to protect employees from exposure to respirable crystalline silica, including engineering controls, work practices, and respirators to be used;
- **Contents of MIOSHA Part 690;**
- **Identity of the competent person** designated by the employer
- **Purpose and a description of the medical surveillance program.**



# Recordkeeping

## Part 690, 1926.1153 (j)

- Make and maintain accurate records:
  - Air monitoring data,
  - Objective data, **AND**
  - Medical records.
- Content of records specified by the standard.





# Dates: Construction Standard

## Part 690, Rule 69005

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<b>JUNE 2017</b>						
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	<b>23</b>	24
25	26	27	28	29		

Employers must comply with all requirements, except methods of sample analysis, paragraph (d)(2)(v), by **June 23, 2017**.

OSHA issued a memorandum indicating **enforcement will be delayed until September 23, 2017**.



# Dates: Construction Standard – continued

## Part 690, Rule 69005

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<b>JUNE 2018</b>						
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

- Compliance with **methods of sample analysis** required by **June 23, 2018**.
- Methods of sample analysis, section (d)(2)(v):

The employer shall ensure that all samples taken to satisfy the monitoring requirements of paragraph (d)(2) of this section are evaluated by a laboratory that analyzes air samples for respirable crystalline silica in accordance with the procedures in Appendix A to this section.



# Appendix A: Methods of Sample Analysis

## Part 690

- Specifies procedures for analyzing air samples for respirable crystalline silica and quality control procedures employers must ensure laboratories use when performing an analysis.
- The employer must ensure the laboratory:
  - Evaluates all samples using one of six analytical methods;
  - Is accredited with respect to crystalline silica analyses;
  - Uses the most current traceable standards for instrument calibration or instrument calibration verification;
  - Implements an internal quality control (QC) program;
  - Characterizes the sample material; **AND**
  - Analyzes quantitatively for crystalline silica and performs specified instrument calibration checks.





# Appendix B: Medical Surveillance Guidelines

## Part 690

Appendix is divided into seven sections:

- Section 1: Recognition of silica-related diseases.
- Section 2: Medical surveillance.
- Section 3: Roles and responsibilities.
- Section 4: Confidentiality and other considerations.
- Section 5: Resources.
- Section 6: References.
- Section 7: Sample forms.





## Resources

- Silica Small Entity Compliance Guide for Construction  
[www.osha.gov/Publications/OSHA3902.pdf](http://www.osha.gov/Publications/OSHA3902.pdf)
- OSHA's Crystalline Silica Rule Fact Sheets:
  - [Fact Sheet on General Industry/Maritime](#)
  - [Fact Sheet on Construction](#)
- NIOSH Silica Information Webpage  
[www.cdc.gov/niosh/topics/silica](http://www.cdc.gov/niosh/topics/silica)



# Resources

Silica Small Entity Compliance Guide for Construction  
[www.osha.gov/Publications/OSHA3902.pdf](http://www.osha.gov/Publications/OSHA3902.pdf)

OSHA Crystalline Silica Fact Sheet  
[osha.gov/OshDoc/data\\_General\\_Facts/crystalline-factsheet.pdf](http://osha.gov/OshDoc/data_General_Facts/crystalline-factsheet.pdf)

NIOSH Silica Information Webpage  
[www.cdc.gov/niosh/topics/silica](http://www.cdc.gov/niosh/topics/silica)

Center for Construction Research and Training  
[www.silica-safe.org](http://www.silica-safe.org)

Federal Register – Silica Standard  
<https://www.federalregister.gov/documents/2016/03/25/2016-04800/occupational-exposure-to-respirable-crystalline-silica>

Video clips – What's Working  
<http://www.silica-safe.org/whats-working/controlling-silica-dust-learning-from-each-other>

Hollow drill bits for rotary hammers with local exhaust ventilation  
<https://www.youtube.com/watch?v=iC-Ze4jTs0M>





## Summary

Provided an overview of the content of MIOSHA Part 690, Silica in Construction.

